**Stat & Data Analysis 3.2 notes**

***NORMAL CURVE:***

Shape:

Described by…

Mean shows…

Standard deviation shows…

Describes a population:

Examples of curves:

(1) (2) (3)

Approximating the Std. Deviation:

***The 68-95-99.7% rule***

Amount of data between 1, 2, 3 standard deviations on a normal curve

Picture:

So…

\_\_\_\_\_\_\_\_\_\_% of the data is within \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_% of the data is within \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_% of the data is within \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***Example:***

Test scores on the Ch. 5 test have a mean of 70 and a standard deviation of 9. Draw the normal curve below:

What percent of the students scored between 61 and 79?

What percent of students scored between 52 and 87?

What percent of students scored between 43 and 96?

What percent of students scored below 43 or above 96?

**Example 2:**

1. The life expectancy of a particular brand of light bulb is normally distributed with a mean of 1500 hours and a standard deviation of 75 hours.
   1. Sketch the picture of this normal curve below. Be sure to label the picture!
   2. What percent of the light bulbs last more than 1560 hours?
   3. What percent of the light bulbs last between 1390 & 1680 hours?

***CALCULATOR:***

* Go to 2ND, then DISTR (the VARS button)

NORMALCDF(

* + Used for…
  + Infinity on the calculator…
  + NOTATION:
  1. What percent of the light bulbs last less than 1400 hours?
  2. What percent of the light bulbs last more than 1710 hours?
  3. What percent of the light bulbs last between 1450 and 1660 hours?
  4. What percent of the light bulbs last between 1260 and 1515 hours?

**Example 3:** Test scores. Average of 75, standard deviation of 8.

1. Draw the Normal Model and label
2. What score has 30% of the data below it?

***CALCULATOR:***

INVNORM(

* + Used for…
  + Only does…

1. What test score has 40% of the data **below** it?
2. What test score has 70% of the class **above** it?
3. What test score has 80% of the data **below** it?

***Examples: USE PROBABILITY NOTATION and CALCULATOR FUNCTIONS***

1. The life expectancy of wood bats is normally distributed with a mean of 60 days and a standard deviation of 17 days.
2. Draw and label the normal model
3. What is the probability that a randomly chosen bat will last at least 60 days?
4. What percent of bats will last at least 70 days?
5. What percent of bats will last between 40 and 80 days?
6. What is the probability that a bat will break during the first month (30 days)?
7. What percent of bats will last less than 40 days?
8. What amount of days do 40% of the bats last **longer** than?
9. What amount of days do 30% of the bats last **under**?
10. A packing machine is set to fill a cardboard box with a mean of 16.1 ounces of cereal. Suppose the amounts per box form a normal distribution with a standard deviation equal to 0.04 ounce.
11. What percentage of the boxes will end up with at least 1 pound (16 ounces) of cereal?
12. What percentage of the boxes will have more than 16.2 ounces of cereal?
13. What percentage of the boxes will have between 15.95 and 16.15 ounces of cereal?
14. What percentage of the boxes will have less than 15.85 ounces of cereal?
15. Ten percent of the boxes will contain **less** than what number of ounces?
16. Eighty percent of the boxes will contain **more** than what number of ounces?
17. The middle 90% of the boxes will be **between** what two weights? *(hint: draw a picture so you know what you’re looking for)*
18. Assume that the distribution of scores on the Ch. 5 Stat quiz is known to be normally distributed with a mean of 70 and a standard deviation of 5.3.
    1. What is the probability that students scores between an 80 and an 85?
    2. What is the probability that a student fails? (below a 60%)
    3. What is the probability that a student scores between a C+ (77) and a B+ (87)?
    4. What is the probability that a student scores an A? (above a 93)
    5. What score represents the 3rd quartile? *(hint: think about what percent of the data is below or above the 3rd quartile)*
    6. What observation has 30% of the observations above it?
    7. What scores have the middle 60% of the data between them?